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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/628,614 | 07/28/2003 | Roger Y. B. Young | 03-0460 | 4439 |
| 24319 | 7590 | 12/01/2005 | EXAMINER | |
| LSI LOGIC CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035 | | | LE, QUE TAN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2878 | |

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/628,614

Applicant(s)

YOUNG ET AL.

Examiner

Que T. Le

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-7 and 10-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 2-7 and 10-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

This is in response to Applicants' amendment filed October 14, 2005.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuji 6,906,794.

Tsuji discloses a semiconductor wafer inspection system comprising: an image capturing device (60, 74, 100, a microscope with a review system) to view at least a portion of an edge of the wafer (2) and generating a plural images of the edge of the wafer; a database (75, 76, 77, 78) receiving the generated images and storing the received images for subsequent analysis and/or inspection (columns 6-10); and a

computer (75, 76) to retrieve the selected stored image upon instructions from a user/operator to perform image analysis to locate and identify any defects on the edge of the wafer (columns 6-11). Tsuji also discloses the method of operation including setting desired angles of the image capturing device relative to the edge of the wafer (Figures 2, 6, 10), magnification of the device, focus of the device, brightness of an illumination source, and the rotational speed of the wafer (columns 4-7). The Tsuji's system inherently performs the claimed method steps.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 5-7, 10-15 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji 6,906,794.

With respect to claims 2 and 3, although Tsuji fails to specify whether or not the microscope of the image capturing device including the use of a scanning electron microscope, the use of a scanning electron microscope for capturing image in an optical inspection system in order to provide better image information/data would have been known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tsuji accordingly in order to provide more accurate inspection results from the system. The further inclusion of setting an accelerating voltage of an electron beam would have also been obvious for similar reasons set forth above.

With respect to claim 5, although Tsuji lacks a clear inclusion of scanning the edge of the wafer from a region interior of a top to a region exterior of a bottom of the edge, selecting a specific manner for scanning an object to be inspected or a wafer for providing a specific pattern of image to be taken by the image capturing device would have been obvious to one of ordinary skill in the art. It would have been obvious to modify Tsuji accordingly in order to provide a better image pattern to be recorded or stored or displayed, if so desired.

With respect to claims 6 and 7, although Tsuji lacks a clear inclusion of comparing the previous defect information to the after defect information to locate any added defects and/or any repaired defects, repeatedly inspecting the same area or portion of an inspected object or wafer for ensuring a complete inspection performance would have been obvious to one of ordinary skill in the inspection art. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tsuji accordingly in order to provide a more reliable inspection performance of the system.

Regarding claims 10-15, although Tsuji discloses different scenarios during the operation of the system but lacks a clear inclusion of an inspection during fabrication of integrated circuit components on the wafer, and a plurality of inspection stations within the fabrication system, it would have been inherently included ("defect inspection is executed in each manufacturing step", columns 1-2; "the wafer edge portion entirely comes within the field of view of the objective lens", column 5; "the related defect data and the image data are preferably stored. The defect data and the image data may be

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used in subsequent inspection”, column 6), however, if not, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tsuji accordingly in order to provide a faster production line for making a semiconductor wafer. The further selection of a recorded image or images the associated defect determination would have been obvious to one of ordinary skill in the art for similar reasons set forth above.

Regarding claims 17-20, the inclusion of a second image capturing device would have been an obvious aggregation to one of ordinary skill in the art, thus, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify the proposed system of Tsuji, discussed in the discussion of claims 10-15 above, for similar reasons set forth above. The inclusion of the determination of any added defects and/or repaired defects would have been obvious for similar reasons set forth in the discussion of claims 6 and 7 above.

Applicant's arguments filed October 14, 2005 have been fully considered but they are not persuasive.

With respect to Applicants' argument, on pages 11-12 of the remarks, in which applicants comment that repeated inspection and review of results (subsequent review of results) cannot imply or suggest that any “added defects” or “repaired defects” will necessarily be identified, this is not found persuasive. It would have been known in the art that repeatedly inspecting and/or reviewing performance/operation or result(s) would have been a clearly indicative of an action and/or intended purposes to “refine”, to “make sure” or to “improve” any imperfection and/or undesired result from a being done

(previous) performance(s) or result(s), which is at least similar to the intended scope of the claimed invention as recited by applicants at least in claims 6 and 7 “after a second process step, repeating the aforementioned steps (scanning the edge of the wafer, recording an image from the image capturing device, analyzing the image, and identifying any defect); ... and identifying any new defects as added defects due to the second process step”. Note that Tsuji, column 6, states that “The defect data and the image data may be used in subsequent inspection” and/or on Fig. 3 with “Repeat operations as needed”. Thus, the rejection set forth above is proper.

With respect to applicants’ argument, on pages 12-13, of the remarks, regarding whether or not Tsuji reference clearly disclose or fairly suggest correlating performance of the recorded image information and the process step after which it was taken, this is found not persuasive because Tsuji, at least in columns 6, 7 and 11 as pointed out and admitted by applicants, discloses the storage of related defect data and the image data for further use (column 6), the registering and/or recording of detected defects, the related observation process (column 7), the correlation of image data, defect data and the inspection process for updating data in the defect processing performances (columns 8-9). Thus, the rejection set forth above is proper.

With respect to applicants’ argument, on pages 13-14, of the remarks, concerning the positioning method step and the associated scanning performance of the scanning electron microscope, it is noted that Tsuji discloses a positioning device (movement stage 30, rotatable table 21, and the alignment mechanism, column 7) while

the selection of use of a scanning electron microscope would have been obvious as set forth in the above rejection. Thus, the rejection set forth above is proper.

With respect to applicants' argument, on pages 14-15 of the remarks, that the claimed invention providing "automatically" method steps (inspecting, recording capturing/generating image) but not that for the system of the reference, this is found not persuasive because it is noted that in the Tsuji's system, at least in column 6, Tsuji states that "An automatic defect classification software is installed in the image processing section" while the image processing section is automatically performed by a camera/microscope (60, 74, 100), computer (76), memory (77, 78), display (80, 81), defect detecting section (79), and information reading section (82). There is no indication and or suggestion, in Tsuji disclose, that any of the above mentioned performances is being performed by hand, except input data must be desirably input by an operator/user as that of the present claimed invention. Thus, the rejection set forth above is proper.

In response to applicant's arguments, on pages 15-17 of the remarks, that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation for the rejection is found in the knowledge

generally available to the examiner as one of ordinary skill in the art, and thus, the rejection set forth above is proper.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Que T. Le whose telephone number is (571) 272-2438.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Epps Georgia, can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Que T. Le'.

Que T. Le
Primary Examiner
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